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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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2872

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EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/598,406

Applicant(s)

HOPPEN, GERHARD

Examiner

Audrey Y. Chang

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-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The abstract of the disclosure is objected to because it contains the phrase “where 760 nm = λ_{IR} = 920 nm” that makes no sense. Correction is required. See MPEP § 608.01(b).

Claim Objections

3. Claims 17 and 18 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification fails to teach the reasons as to why would the microscope objective simply contains lens groups made of quartz and fluorite, which are common lens materials for making ultraviolet lens, are capable of focusing both ultraviolet light (235 nm) and infrared light (760 nm) at the same focal point. It is generally understood in the art that the lens materials have dispersion effect that causes the

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ultraviolet light and the infrared light, having very different wavelengths, to refract through the lenses in very different direction. It is therefore expected that the focal point for the light of these very different wavelengths would be different. The specification only gives a spectral image focus curve but totally silent about how to achieve this feature physically. The specification also fails to teach the physics behind that enables such feature. Is this then an inherent property for the lens materials? If so, then this feature is expected to be implicitly met by any lens groups made of quartz and fluorite. Clarifications are required. But no new matter should be added. Claims 2-18 inherit the rejection from their base claim.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The applicant is respectfully reminded that the claims as stand now contain descriptive type of language and contains numerous errors, confusions and indefiniteness. The examiner can only point out a few. It is applicant's responsibility to clear ALL of the discrepancies to make the claims in comply with the requirements of 35 USC 112.

The phrase "has a focus at a DUV wavelength $\lambda_{\text{DUV}} = 235 \text{ nm}$ " recited in claim 1 appears to be vague and indefinite since it is not clear if this phrase means the objective lens will not be able to focus light having wavelength other then this particular wavelength. This does not seem to make any physical sense because a lens group may be designed to operate in certain wavelength range but it is capable of focusing light with all wavelengths in that particular range. It is not clear how can a lens group only focus one particular wavelength. If this is the case, it is not clear how should one interpret Figure 9 of the instant application where focus are possible for all the wavelength ranged from ultraviolet to infrared.

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The phrase “as well as short focal length” recited in claim 1 appears to be indefinite since it is not clear to what standard is this focal length considered to be short.

The phrase “for which purpose” recited in claim 1 appears to be vague and indefinite since it is not clear what does this mean. The term “penultimate element” appears to be vague and indefinite since it is not clear how does this relate to the term “lens groups”. It is not clear if this is related to a single element next to the last “single element” or is the “lens group” next to the last lens group.

The phrase “is much smaller” recited in claim 1 appears to be vague and indefinite since it is not clear how small is “much smaller”. The scope of the claim therefore is unclear.

The phrase “the divergent penultimate element” recited in claims 3-6 appears to be vague and indefinite since it lacks proper antecedent basis from its base claim.

Claim 7 appears to be in complete since it is not clear what are the structural relationships between the elements recited in claim 7 and the penultimate element recited in its base claim (claim 1).

The phrase “is much smaller” recited in claim 7 appears to be vague and indefinite since it is not clear how small is “much smaller”. The scope of the claim therefore is unclear.

The phrases “the converging individual lens” and “the doublet” recited in claim 8 appear to be vague and indefinite since it is not clear which converging lens and which doublet in its base claim (claim 7) are referred to here. The triplet recited in claim 8 also appears to be vague and indefinite since it is not clear how does this triplet relate to the triplet in its base claim.

Claims 9-18 each recites the DUV focus in DUV wavelength ranges that are different from and outside the range around 235 nm (as stated in their base claim) which appear to be contradictory. Since it is not clear what DUV focus wavelength range is actually claimed in each of the claims. Similarly claims 10-17 also recites that the objective has an infrared focus at different wavelengths from 760 nm (as stated in their base claim). These are contradiction to their base claim and make the scope of the claims unclear.

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Claims 10-16 recites the phrase “possesses the data listed in Table 1 (or 2 and so on)” that appear to be vague and indefinite. Since it is not clear how does the data listed in each table relate to the different lens elements recited in the claims.

Furthermore, claims 17 and 18 fail to further limit their base claim.

Clarifications to the claims are required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hayashi (PN. 5,144,475).

Hayashi teaches an objective lens system (121 in Figure 12) for use in a microscope that is operable in ultraviolet or far ultraviolet wavelength ranges wherein the objective lens system comprises a plurality of lens elements or groups (11, 12, 13, 14, 15, 16 in Figure 3) that is made of *quartz* and *fluorite*, (please see Figures 3, 6, 8, 10 and 12 and the abstract). It is implicitly true that objective lens is capable of focusing light having wavelength in the ultraviolet and far ultraviolet range which is known in the art to be between 1nm to 375 nm. This certainly includes the range of 200 to 300 nm and 235 nm.

Hayashi also teaches that the objective lens system comprises an element (15) next to the last element, that serves as the penultimate element, which has a configuration that is concave at both sides, (please see Figure 3). The radius of curvature for the concave surface at the object side is smaller than the radius of curvature for the surface at the image side.

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This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the objective lens also has an infrared focus point that is the same as the focus point for the ultraviolet light. However the instant application fails to teach adequately as to how does the objective achieve such feature. This feature therefore can not be addressed now. Since it is not clear if such feature is an inherent property for the lens materials such as *quartz* and *fluorite* or is an inherent property of the biconcave configuration of the penultimate element or other non-inherent reasons. If this feature is the result of the inherent properties then it is met by the cited Hayashi reference.

10. Claims 2, 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hayashi as applied to claim 1 above, and further in view of the patent issued to Ono et al (PN. 5,142,410).

The objective lens for microscope that is operable in ultraviolet or far ultraviolet wavelength ranges taught by Hayashi as described for claim 1 above has met all the limitations of the claims. This reference however does not teach explicitly that the biconcave lens, serves as the penultimate element, is either a doublet or a triplet. But to replace a single lens by a lens group consists, either of a doublet or of a triplet or even more number of lens elements, is rather a well-known practice in the art. Since for one thing a single lens and a lens group that has the same lens property as of the single lens are considered to be art recognized equivalent. Ono et al also demonstrates that a single biconcave lens (12 Figure 19) may be replaced either by a biconcave doublet having two lens elements (22 and 23 Figure 23) or by a biconcave triplet having three lens elements (19, 20 and 21 Figure 21). It would then have been obvious to one having ordinary skill in the art to make the biconcave lens element of Hayashi either of a doublet or a triplet for the benefit of providing alternative arrangements for the penultimate element.

With regard to the features concerning the lens materials, Hayashi teaches that both fluoride and quartz are well known lens materials for making lens operable in ultraviolet wavelength range. It is well

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known in the art that lens made of different materials would have different optical properties. It would then have been obvious to one skilled in the art to modify the lens by using different mixtures of the materials for the benefit of providing lens element having desired optical property in the desired wavelength ranges.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hayashi and Ono et al as applied to claim 2 above, and further in view of the patent issued to Shafer et al (PN. 5,717,518).

The microscope objective taught by Hayashi in view of the teachings of Ono et al has met all the limitations of the claim. Hayashi reference teaches that the lens may be made of fluorite but does not teach explicitly that it is lithium fluoride. However lithium fluoride is well known in the art to have good ultraviolet light transmission property as demonstrated by the teachings of Shafer et al (please see column 5 lines 1-10). It would then have been obvious to one skilled in the art to make the fluorite lens material of Hayashi a lithium fluoride. Since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Hayashi as applied to claim 1 above, and further in view of the patents issued to Ono et al and Shafer.

The microscope objective taught by Hayashi as described for claim 1 above has met all the limitations of the claim. The cited reference however does not teach that the penultimate biconcave lens element is a triplet. However this feature is the same as in claim 3 and it is rejected for the same reasons based on the teachings of Ono et al set forth above.

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The cited Hayashi reference also does not teach explicitly that the fluorite lens material is lithium fluoride. However lithium fluoride is well known in the art to have good ultraviolet light transmission property as demonstrated by the teachings of Shafer et al (please see column 5 lines 1-10). It would then have been obvious to one skilled in the art to make the fluorite lens material of Hayashi lithium fluoride. Since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US patents issued to Hayashi (PN. 5,159,492) and Shoemaker (PN. 3,975,087) each discloses a microscope objective having a biconcave lens element.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

A. Chang, Ph.D.
May 3, 2001



Audrey Chang
Primary Examiner
Technology Center 2800